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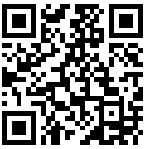

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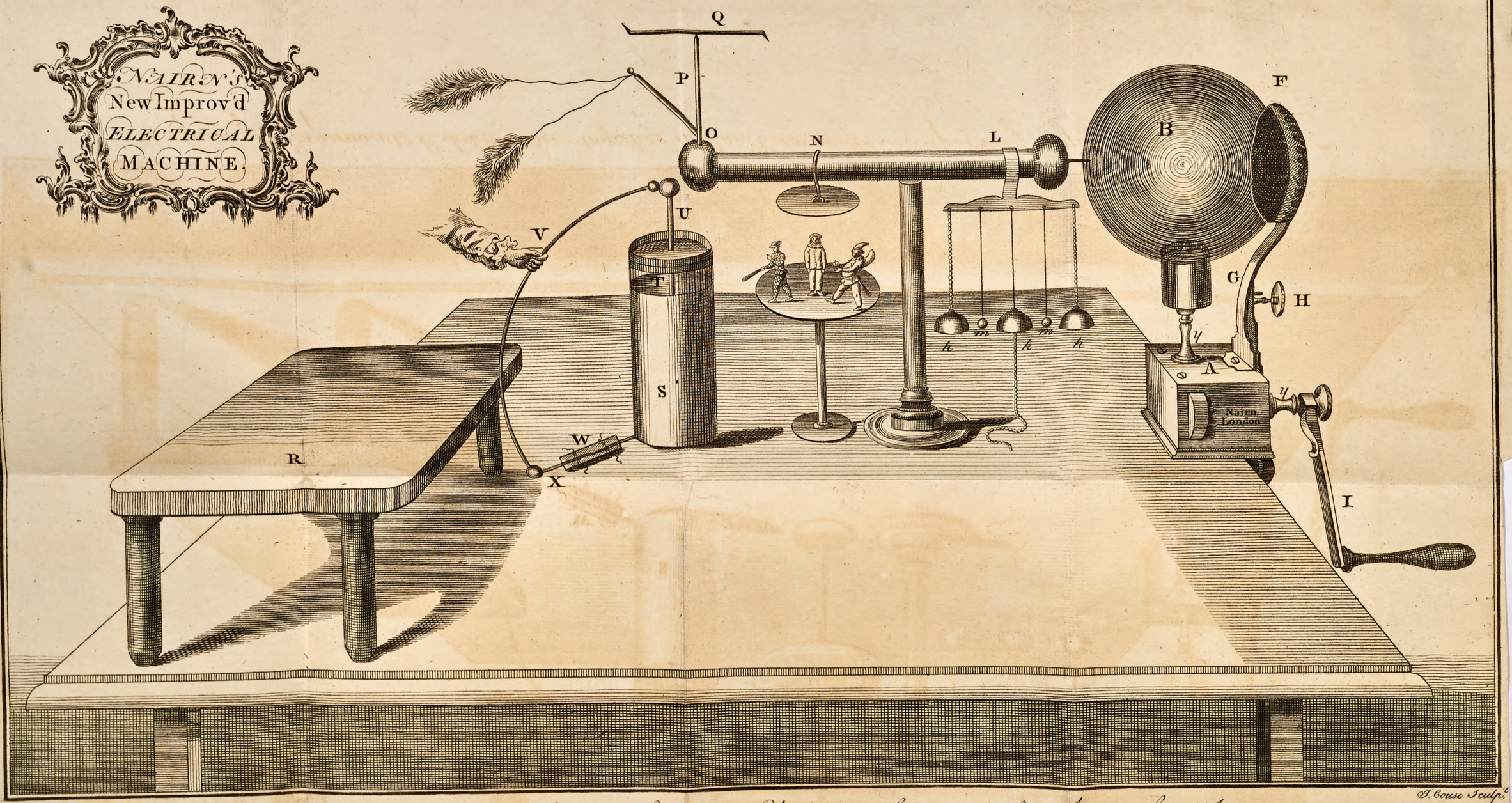
NAIRN'S New Improv'd ELECTRICAL MACHINE.



The principal Experiments Exhibited here together in One View, are to be separately Tryed by this Apparatus.

T. Couse Sculp.t

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DIRECTIONS

For using the

Electrical Machine,

As Made and Sold by

EDWARD NAIRNE,

Optical, Philosophical, and Mathematical Instrument-maker,

Fronting the

ROYAL EXCHANGE,

IN

CORNHILL, *LONDON.*

Printed in the YEAR MDCCLXXIII.

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DIRECTIONS

For using

NAIRNE's

Electrical Machine.

THE Braſs Box A, which contains the Wheel and endleſs Screw that turns the Globe B, being faſtened to any Table by means of the two Finger Screws at the Bottom; then the Mahogany Foot C, with the Glaſs Pillar D, on which is fixed the Prime Conductor E, is to be placed, ſo that the Point in the end of it may be as near as poſſible to the Globe B, without touching the Surface of the Globe; ſo much of the Apparatus being thus fixed, the Cuſhion F*, with the Spring G, to which it is faſtened, muſt be taken from the Braſs Box A, and then the Globe muſt be wiped very clean with a dry, ſoft, rumpled Linen Cloth; and if the Air is very damp, the Globe, and the reſt of the Apparatus (except the Cuſhion) ſhould be dryed by the Fire: This being done, the Spring G, with the Cuſhion F, muſt be applied to the Braſs Box A, and the Cuſhion preſs'd

 gently

* To this Cuſhion F is affixed a Piece of oiled Silk which is found to be of great Uſe to the Machine.

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gently againſt the Globe, by means of the Finger Screw H; then, on turning the Winch I, the Globe will be put in Motion*, and the Surface rubbing againſt the Cuſhion, will excite the Electrical Fire, which will be viſible on applying the Knuckle within half an Inch of any Part of the Prime Conductor E, by a Spark of blue Fire iſſuing from it with a ſmart Snap. The Electrical Fire being thus excited, the other Parts of the Apparatus may be ſeparately applied.

As for Inſtance, in uſing the Bells k k k, the Braſs Piece to which they are hung, is to be hook'd on the Conductor as at L, the Globe being put in Motion, the Balls m m, will be attracted and repell'd, whereby the Bells will ring, and Sparks of Fire will appear between them; but if any Perſon touches the Prime Conductor, or preſents the Point of a Pin or Needle near it, the Bells will preſently ceaſe ringing, and on withdrawing the Pin, or not touching the Conductor, they will immediately ring as before.—If an electrical Jar be placed at the end of the Prime Conductor in this Experiment, when the Jar is charged the Bells will continue to ring (without turning the Globe) ſo long as any Electricity remains in the Jar.

Note, The two outward Bells are hung with Chain, and the middle Bell and two Balls

* Obſerving that the Cuſhion to which the oiled Silk is faſtened be ſo placed that on turning the Globe it has a tendency to carry the oiled Silk with it.

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Balls with Silk, without any Mixture of Cotton or Thread, and a Chain, or Wire muſt hang from the middle Bell to the Table, otherwiſe they will not ring, though the Globe ſhould act ever ſo ſtrong, as may be eaſily tried, by hanging the Chain over the Frame to which the Bells are hung, ſo that it may not touch the Table.

The Bells being taken from the Prime Conductor E, and the Braſs Plate hung on as at N, then the Braſs Stand muſt be placed directly under the ſuſpended Plate, and the broad Plate being put on the Stand, with Pieces of Leaf Gold laid upon it, the Inſtant the Globe is put in Motion, the Pieces of Leaf Gold will be attracted by the upper Plate, and then repell'd, and ſo continue as long as the Electricity is excited.

The Leaf Gold being taken away, and the Images (which ſhould be of the thineſt Paper) put on the broad Plate, then, if the Globe is ſtrongly excited, they will be raiſed up and ſtand erect, as repreſented in the Print; but if they are brought nearer the ſuſpended Plate (which is eaſily done, the Stand being made to lengthen for that Purpoſe) they will dance with a great Variety of pleaſing Motions. The proper Diſtance muſt be found by Trial. If too near, they will be attracted and repell'd as the Leaf Gold, or any other light Body; but on the leaſt Touch of a Finger on the Prime Conductor, or preſenting

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ſenting the Point of a Needle or Pin, they will immediately fall.

The Wire (to which the two Feathers are hung by Linen Threads) is to be put in the Hole at the End of the Prime Conductor, as ſhewn at O; then if the Globe be put in Motion, both the Feathers will be electrified, as they are ſuſpended by Linen Threads, and the Feathers themſelves will not only be repell'd, but the Parts of each Feather will repell one another, which gives a lively Repreſentation of the Senſative Plant, for upon the leaſt Touch of a Finger upon the Prime Conductor, (like the Leaves of the ſaid Plant,) they will inſtantly ſhrink and cloſe up; the ſame Thing will happen upon the Approach of the Point of a Pin or Needle.

This Part of the Apparatus being done with, the Wire P is to be fix'd into the aforeſaid Hole O, and the Wire Q (with its two Ends bent) is to be put on it, there being a ſmall Hole in the Middle for that Purpoſe, where it will be ſupported in Equilibrio. The Room now being darkened, if the Globe be put in Motion, the Wire will begin to move, and will increaſe in its Velocity for a conſiderable Time, ſo that the Bruſh of Fire, which at firſt was only viſible at each Point, will at laſt, by the Swiftneſs of the Motion, appear one continued Circle of Light. The Wire Q being taken off, a bruſh of blue Fire will be ſeen to iſſue from the Point of the Wire

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Wire P, and the Hand will feel the Senſation of a Blaſt of cold Wind, if held over it, at the Diſtance of about two Inches.

The Electrical or Inſulated Stool R, is to place any thing upon to be Electrified. The Glaſs Legs muſt be wiped very clean, and if the Air is damp, it ſhould be warm'd by the Fire; then lay a ſheet of Paper on the Floor, and put the Stool on it. The Reaſon of this Precaution is, that the Stool, when it is Electrified, attracts any Duſt that is near it, which will carry off the Electricity, and the Experiment on the Stool will then not ſucceed, but by means of this Paper, thoſe Inconveniencies will be removed.

Any Perſon ſtanding on the Stool, and at the ſame Time touching the Prime Conductor, with a Wire, or with any other Conductor, obſerving that he touches no other Part of the Machine but the Prime Conductor, and that no Perſon or Thing has any Communication with him. Theſe Precautions being obſerved, if the Globe be put in Motion, the Perſon on the Stool will thereby be Electrified, and Sparks of Fire will be emitted from him upon touching any Part of him, the ſame as from the Prime Conductor.

Let this Perſon on the Stool hold in his Hand a Pewter Plate, and another Perſon on the Floor hold one with Bran or Pollard, at the

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the Diſtance of three or four Inches, directly under it; the Pollard or Bran will be attracted and repell'd between the two Plates, in ſuch a manner as to reſemble a ſtormy Shower; if the Perſon on the Stool hold the Hook L with the Bells, in his Hand, and another ſtanding on the Floor touches the Chain that hangs from the middle Bell, they will immediately ring, Bringing a Point of a Pin or Needle alſo, near the End of the Chain, will have the ſame Effect; but if he lets go the Chain, or withdraws the Point, they will inſtantly ceaſe.

If the Perſon on the Stool holds the Braſs Plate by the Hook N, and another Perſon ſtanding on the Floor, holds the broad Plate directly under, with Pieces of Leaf Gold, or the Paper Images, the Gold will be attracted and repell'd, and the Images will dance.

Likewiſe, if the Wire P, with the Wire Q on it, or the Wire with the Feathers, are held by the ſaid Perſon on the Stool, the Wire will move round, and the Feathers will repel each other, in the ſame manner as when on the Prime Conductor.

If this electrified Perſon holds a large Spoon, with warm rectified Spirits, and another Perſon ſtanding on the Floor offer to touch the Surface thereof with the End of his Finger, the Spirits will take Fire; the ſame

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ſame will happen, if the Perſon on the Floor holds the Spoon, and the electrified Perſon touches the Spirits.

The Glaſs Jar S, is lined within ſide, and covered without with Tin Foil, which is found by Experience to be far preferable to Vials filled with Water or Fileings; the uncovered Part T, muſt be always wiped very clean and dry. To charge this Jar with the Electrical Fluid, it muſt be placed on the Table, ſo that the Ball at the End of the Wire U, may be very near the End of the Prime Conductor, as repreſented in the Print, then the Globe being put in Motion, the Fire will ruſh from the End of the Conductor to the Ball, with a ſmart Snaping; as ſoon as it ceaſes, it is a certain Sign that the Jar is ſufficiently charged; to diſcharge it then, without receiving any Shock, take the circular Wire V, which may be bent to any Curve, with the Balls at each End, and apply one End to the Bottom of the Jar, and keeping it there, bring the other End to the Ball at the Top of the Jar, or to the End of the Conductor, and the Jar will be diſcharg'd with a loud Snap, and large Spark of Fire.

If a Number of Perſons are deſirous of feeling the Electrical Shock, let them join Hands, and the Jar being charged, the firſt Perſon muſt take hold at the lower Part of the Covering of the Jar, and the laſt touch the Ball on the Top of the Wire U, and they

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will (if they all continue in Contact) feel the Shock the ſame Inſtant, or if a ſingle Perſon takes hold of the Jar with one Hand, and with the other touches the Ball, he will receive the Shock.

Leaf Gold, or Leaf Braſs, may be melted by Electricity. W repreſents two Pieces of Glaſs tied together with Sewing Silk, with long narrow Strips of Leaf Gold between them, the Breadth of a Straw; the Jar being charged, lay the Glaſs on the Table, ſo that the Part of the Leaf Gold which hangs out beyond the Glaſs may be in Contact with the Jar near the Bottom, as in the Plate; then apply one End of the circular Wire to the other Part of the Leaf Gold, as at X, and keeping it there, bring the other End of the circular Wire to the Ball on the Wire U, and the Electrical Fluid will paſs through the Leaf Gold; and if your Strips of Glaſs remain whole, you will ſee that the Gold is miſſing in ſeveral Places, and inſtead of it, a metalic Stain on both the Glaſſes, the Stains on the upper exactly ſimilar to that on the under, in the minuteſt Stroke, as may be ſeen by holding them to the Light.

The Globe ſhould be wiped often with a dry Cloth, and if a ſmall Quantity of Amalgama * of Mercury be well rubbed on the Leather

* The Amalgama is made with two Ounces of Mercury, and one Ounce of Tin Foil, mix'd well together with a ſmall Quantity of Tallow, Soap or Bees-Wax. This was Mr. *Canton's* Invention.

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Leather of the Cuſhion, the Globe will act much ſtronger; and the Cuſhion will not require to be preſs'd hard againſt the Globe, and yet the Globe will be ſtrongly excited by it, even in damp Weather.

Note 1, When the Leather has been uſed a conſiderable Time, it will be proper to put a new one.

2. If a lighted Candle be placed near the Prime Conductor, it will carry off much of the Electrical Fluid.

3. The Inſide Work contain'd in the Braſs Box A, may be eaſily got at, by preſſing the Button at the Side of it, whereby the Front of the ſaid Box will ſpring open. This Work as well as the two Axes, in their Sockets y y, ſhould be frequently oil'd, if the Machine is much uſed.

P. S. In order to render this Machine more commodious, another Braſs Conductor, with a mahogony Foot and Glaſs Pillar. And a Cuſhion with an inſulated Stand which may be eaſily added; whereby Electrical Experiments, either poſitive or negative, may be performed with this Machine.

FINIS.

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